

1. The number 123456789 and 999999999 are multiplied. How many of the digits in the product are 9's ?

- (1) 0 (2) 1  
(3) 2 (4) 3

2. If the expression  $15^6 \times 28^5 \times 55^7$  is evaluated, the number of zeros at the end of the number is

- (1) 8 (2) 10  
(3) 18 (4) 20

3.  $\sqrt[4]{2001\ 2001\ 2001\ 2001}$  is closest to

- (1) 2001 (2) 2100  
(3) 6700 (4) 10010

4. The units digit of  $(2002)^{2002}$  is

- (1) 2 (2) 4  
(3) 6 (4) 8

5. Three different numbers are chosen such that when each of the numbers is added to the average of the remaining two, the number 65, 69 and 76 are obtained. The average of the three original numbers is

- (1) 35 (2) 38  
(3) 43 (4) 70

6.  $abc$  and  $def$  are 3-digit numbers such that

$$\begin{array}{r} a \ b \ c \\ d \ e \ f \\ \hline 10 \ 0 \ 0 \end{array}$$

and none of  $a, b, c, d, e,$  or  $f$  is 0. What is the sum  $a + b + c + d + e + f$  ?

- (1) 10 (2) 19  
(3) 21 (4) 28

7. When a number is divided by 5, the remainder is 2, when divided by 7, the remainder is 3, when divided by 9, the

remainder is 4. The sum of digits of such smallest number is

- (1) 13 (2) 11  
(3) 9 (4) 7

8. The expression

$$\frac{1}{8} + \frac{1}{10} + \frac{1}{11} + \frac{1}{15} + \frac{1}{20} + \frac{1}{41} + \frac{1}{110} + \frac{1}{1640}$$

is equal to

- (1) 1 (2)  $\frac{13}{15}$   
(3)  $\frac{11}{15}$  (4)  $\frac{7}{15}$

9. Let  $r$  be the least non-negative remainder when  $(22)^7$  is divided by 123. The value of  $r$  is

- (1) 5 (2) 22  
(3) 32 (4) 52

10. If  $\frac{97}{19} = w + \frac{1}{x + \frac{1}{y}}$ , where  $x, y$  and  $w$  are all

positive integers, the value of  $x + 2y - 3w$  is

- (1) 2 (2) -2  
(4) 3 (4) -5

11. Let  $a = 2^{129} \times 3^{81} \times 5^{128}$ ,  $b = 2^{127} \times 3^{81} \times 5^{128}$ ,  $c = 2^{126} \times 3^{82} \times 5^{128}$ , and  $d = 2^{125} \times 3^{82} \times 5^{129}$ .

Then

- (1)  $b > c > d > a$  (2)  $b < c < d < a$   
(3)  $b > c > a > d$  (4)  $b < c < a < d$

12. The positive integer  $a$  is a 2-digit number (01, 02 are *not* 2-digit number) the positive integer  $b$  has 'a' digit and the positive integer 'c' has 'b' digits. The smallest possible value for  $c$  is

- (1)  $10^{99}$  (2)  $10^{10^9}$   
(3)  $10^{10^{10}} - 1$  (4)  $10^{10^9 - 1}$

13. If  $2^{36} - 1 = 68a 19476735$ , when all the digits are correct except  $a$ , the correct value of  $a$  is

- (1) 9 (2) 8  
(3) 7 (4) 3

14. The value of

$$\frac{(1 \cdot 121)^3 - (3 \cdot 333)^3 + (2 \cdot 212)^3}{(1 \cdot 121)(3 \cdot 333)(2 \cdot 212)}$$
 is

- (1) 1 (2) -2  
(3) -3 (4) 4

15. If  $a : b = 3 : 4$ ,  $b : c = \frac{8}{9}$  and  $c : d = \frac{2}{3}$ , then

the value of  $\sqrt[4]{\frac{ad}{b^2}}$  is

- (1)  $\frac{3}{4}$  (2)  $\frac{9}{8}$   
(3)  $\frac{3\sqrt{3}}{4}$  (4)  $\frac{3\sqrt{2}}{4}$

16. The value of  $\sqrt{43 - 12\sqrt{7}} - 2/\sqrt{16 + 6\sqrt{7}}$  is

- (1) 1 (2) 2  
(3) 3 (4)  $3 - 2\sqrt{7}$

17. Let  $N$  be the greatest natural number that will divide 13511, 13903 and 14589 leaving same remainder in each case. The sum of digits of  $N$  is

- (1) 10 (2) 13  
(3) 15 (4) 17

18. The value of

$$\frac{(0.251)^2 - (0.051)^2 - (0.511)^2 - 2(0.051)(0.511)}{(0.251)^2 + (0.051)^2 - 2(0.251)(0.051) - (0.511)^2}$$
 is

- (1)  $\frac{271}{237}$  (2)  $\frac{237}{271}$   
(3)  $\frac{823}{711}$  (4)  $\frac{701}{823}$

19. The cost of making a rectangular table is calculated by adding two variables. The first is proportional to the area of the table and the other to the square of the length of the longer side. In making  $2\text{m} \times 3\text{m}$  table it costs ₹ 5,000 and in making a  $1.5\text{m} \times 4\text{m}$  table, it cost ₹ 6,400. The cost of making a  $2.5\text{m} \times 2.5\text{m}$  table is (nearest to a rupee)

- (1) ₹ 3,383 (2) ₹ 4,583  
(3) ₹ 4,853 (4) ₹ 4,835

20. Anu is walking at a constant speed halfway between two parallel train tracks. On each track is a train of the same length. They are approaching Anu from different directions both at the same speed  $v$  km/hour. The train going in the same direction as Anu going takes  $t_1$  second to pass her, while the other takes  $t_2$  seconds to pass her. Speed of Anu (in km/hour) is

- (1)  $\frac{t_1 - t_2}{t_1 + t_2} v$  (2)  $\frac{t_2 - t_1}{t_1 + t_2} v$   
(3)  $\frac{t_1 + t_2}{t_1 - t_2} v$  (4)  $\frac{t_1 + t_2}{t_2 - t_1} v$

21. A multiple choice examination consists of 20 questions. The scoring is +5 for each correct answer, -2 for each incorrect answer, and 0 for each unanswered question. A student's score on the examination is 48. The maximum number of questions he could have answered correctly is

- (1) 14 (2) 12  
(3) 10 (4) 9

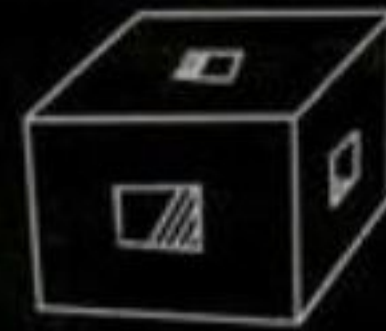
22. At an institute, 99% of the 100 students are girls but only 98% of the students living on the campus are girls. If same girls live on campus, how many students live off campus?

- (1) 2 (2) 40  
(3) 50 (4) 98

23. A and B share a piece of land. The ratio of the area of A's portion to the area of B's portion is 2 : 3. They each grow wheat and

barley on their pieces of land. The entire land is covered by wheat and barley in the ratio 7 : 3. On A's land, the ratio of wheat to barley is 4 : 1. The ratio of wheat to barley for B's land is

- (1) 11 : 19                      (2) 19 : 11  
(3) 11 : 9                        (4) 9 : 11



- (1) 48                                (2) 50  
(3) 72                                (4) 78

24. A box has apples and oranges.  $\frac{2}{3}$  of all the apples and  $\frac{3}{4}$  of all the oranges are rotten. The number of rotten apples equals the number of rotten oranges. What fraction of the total number of fruits in the box is rotten?

- (1)  $\frac{12}{17}$                               (2)  $\frac{5}{17}$   
(3)  $\frac{9}{13}$                                 (4)  $\frac{11}{13}$

25. A TV set is available for ₹ 19,650 cash payment or for ₹ 3,100 cash down payment and three equal annual instalments. If the interest is charged at the rate of 10% per annum compounded annually, the amount of each instalment is

- (1) ₹ 6,555                        (2) ₹ 6,612  
(3) ₹ 6,655                        (4) ₹ 6,665

26. A person bought  $n$  articles for ₹  $d$ . He sold two articles at half their cost and the rest at a profit of ₹ 8 on each article. If the overall profit is ₹ 72, then the least possible value of  $n$  is

- (1) 12                                (2) 10  
(3) 8                                 (4) 16

27. A 3 cm × 3 cm × 3 cm cube has three holes each of 1 cm × 1 cm cross-section running from the centre of each face to the centre of the opposite face. The total surface area (in cm<sup>2</sup>) of the solid so obtained is

28. If a 6 cm × 6 cm square is placed on a triangle, it can cover up to 60% of the triangle. If the triangle is placed on the square it can cover up to  $\frac{2}{3}$  of the square. The area (in cm<sup>2</sup>) of the triangle is

- (1) 24                                (2) 36  
(3) 40                                (4) 60

29. A circular grass plot 4 m in diameter is cut by a straight path 1 m wide, one edge of which passes through the centre of the plot. Area of the remaining portion is

- (1)  $\frac{4\pi}{3} - \sqrt{3}$                       (2)  $\frac{10\pi}{3} - \sqrt{2}$   
(3)  $\frac{10\pi}{3} + \sqrt{3}$                       (4)  $\frac{10\pi}{3} - \sqrt{3}$

30. Three concentric circles have radii (in cm)  $a$ ,  $b$  and  $c$ , where  $a < b < c$ . If  $a = 8$  and  $b = 9$  and the middle circle bisects the area between the other two circles, then the value of  $c$  is

- (1)  $7\sqrt{2}$                               (2)  $6\sqrt{3}$   
(3)  $7\sqrt{3}$                               (4) 10

31. A sphere has a diameter of  $500\sqrt{3}$  cm. A biggest cube is fitted in it. Now a biggest sphere is fitted within this cube. Again a biggest cube is fitted in the smaller sphere. The ratio of the volume of bigger cube to the volume of smaller cube is

- (1) 3 : 1                                (2)  $2\sqrt{3} : 1$   
(3)  $3\sqrt{3} : 1$                         (4)  $4\sqrt{3} : 1$

32. A rectangular box has dimensions  $x$ ,  $y$  and  $z$  units, where  $x < y < z$ . If one dimension only is increased by one unit, then the increase in volume is

- (1) greatest when  $x$  is increased
- (2) greatest when  $y$  is increased
- (3) greatest when  $z$  is increased
- (4) the same regardless of which dimension is increased.

Read the following table and answer questions 33 to 36.

School	Number of Students scoring less than 60% marks	Percentage of Students scoring more than 60% marks	Total Number of Students appeared
A	320	55	800
B	220	40	400
C	300	20	375
D	280	10	350
E	210	25	300

33. Which school has the lowest percentage of students scoring less than 60% marks ?

- (1) A
- (2) B
- (3) D
- (4) E

34. Number of schools which have the same percentage of students scoring exactly 60% is

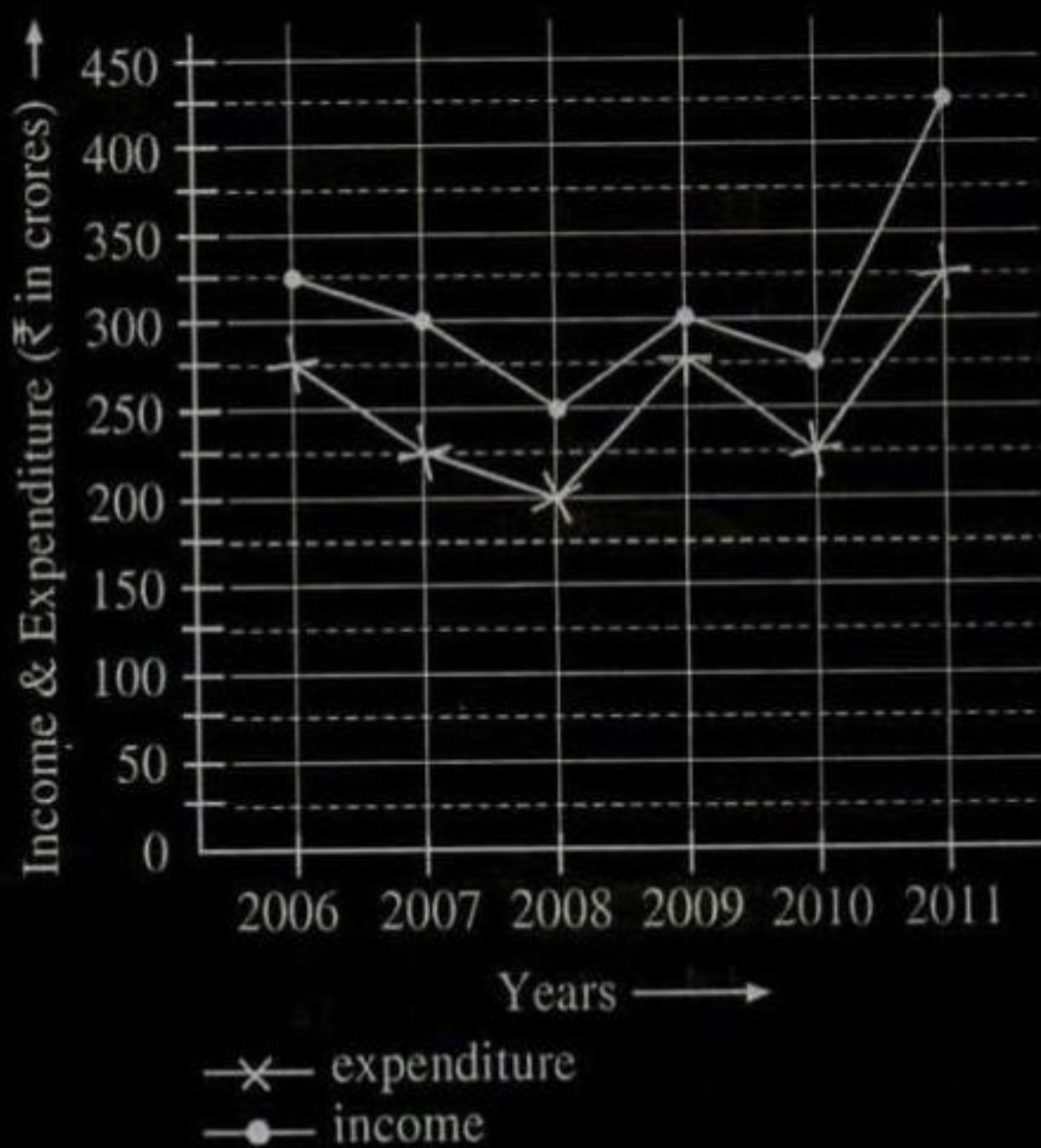
- (1) 1
- (2) 2
- (3) 3
- (4) 4

35. Total number of students scoring 60% or more marks is

- (1) 110
- (2) 775
- (3) 785
- (4) 895

36. The ratio of the total number of students scoring less than 60% marks to that of scoring exactly 60% marks is

- (1) 11 : 133
- (2) 133 : 11
- (3) 157 : 22
- (4) 285 : 179



The above graph shows income and expenditure (₹ in crores) of a company in the years 2006 to 2011. Read the graph and answer the questions 157 to 160.

37. The total expenditure of which of the following pairs of years was equal to the income in 2011 ?

- (1) 2006 and 2007
- (2) 2007 and 2008
- (3) 2006 and 2008
- (4) 2007 and 2010

38. In how many of the given years was the income more than the average income of the given years ?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

39. What was the approximate percentage increase expenditure from 2010 to 2011 ?

- (1) 72.3
- (2) 70.5
- (3) 54.5
- (4) 44.4

40. In which year was the percentage of expenditure to income, the highest ?

- (1) 2009
- (2) 2008
- (3) 2007
- (4) 2006